REMARKS

An excess claim fee payment letter is submitted herewith for one (1) additional independent claim.

Claims 1-20 are all the claims presently pending in the application. Claims 1-2 and 6 are amended to more clearly define the invention and claims 7-20 are added. Claims 1-2 and 6-7 are independent.

These amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability.

Applicants also note that, notwithstanding any claim amendments herein or later during prosecution, Applicants' intent is to encompass equivalents of all claim elements.

Applicants gratefully acknowledge that claims 2 and 6 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. This Amendment rewrites claims 2 and 6 into independent form including all of the limitations of the base claim and any intervening claims to place these claims into condition for immediate allowance. However, Applicants respectfully submit that all of the claims are allowable.

Claims 1, and 3-5 stand rejected under 35 U.S.C. § 102(e) as being anticipated by the Sasaki et al. reference (U.S. Patent No. 6,224,679). Claims 1, and 3-5 stand rejected under 35 U.S.C. § 102(e) as being anticipated by the Mikata reference (U.S. Patent No. 6,224,679).

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

A first exemplary embodiment of the claimed invention, as defined by independent claim 1, is directed to a semiconductor manufacturing device having a mechanical drive part which is moved in a vacuum device while holding a substrate. The device further includes a discharge port for introducing inert gas into the vacuum device, and a flow rate control part for controlling the inert gas that is discharged into the vacuum device from the discharge port at a constant flow rate.

A second exemplary embodiment of the claimed invention, as defined by independent claim 7, is directed to a semiconductor manufacturing device that includes a vacuum chamber, a mechanical driver in the vacuum chamber that drives a semiconductor substrate holder, a discharge port that introduces an inert gas into the vacuum chamber, and a flow rate controller that controls the flow of inert gas through the discharge port.

Conventional semiconductor manufacturing devices include mechanical drive units that use oil and/or grease as a lubricant. These mechanical drive units are positioned within the vacuum chamber of these devices in order to control the motion (i.e. translation, rotation and tilt) of a semiconductor substrate holder. These conventional semiconductor manufacturing devices may also include vacuum pumps that are oil diffusion type pumps. However, the presence of the oil and/or grease within the vacuum atmosphere allows the oil and/or grease to diffuse within the vacuum atmosphere and become attached to the surface of a semiconductor substrate that is being processed. In this manner, the oil and/or grease that is used in these mechanical drive units and/or vacuum pumps tends to contaminate the semiconductor substrate.

In stark contrast, the present invention provides a semiconductor manufacturing

device with a discharge port that introduces an inert gas into the vacuum chamber. In this manner, the flow of inert gas prevents the oil and/or grease from the mechanical drive and/or vacuum pump from diffusing into the vacuum chamber such that it contaminates the surface of the semiconductor substrate that is being processed by the semiconductor manufacturing device.

II. THE PRIOR ART REJECTIONS

A. The 102(e) Sasaki et al. reference rejection

The Examiner alleges that the Sasaki et al. reference teaches the claimed invention. Applicants submit, however, that there are elements of the claimed invention which are neither taught nor suggested by the Sasaki et al. reference.

The Sasaki et al. reference does not teach or suggest the features of the present invention including: 1) a mechanical drive part that is moved in a vacuum device (independent claim 1); and 2) a mechanical driver in the vacuum chamber (independent claim 7).

Rather, and in stark contrast, the Sasaki et al. reference discloses a system for controlling gas in a multichamber processing system which, not only does not include a vacuum, but actually teaches away from having a vacuum.

The Examiner alleges that the Sasaki et al. reference discloses "a discharge port 25 for introducing an inert gas 31 into the vacuum chamber" and cites col. 5, lines 4-15; col. 5, line 44 - col. 6, line 25; col. 7, lines 5-14; and col. 7, line 57 - col. 8, line 6 in an attempt to support the Examiner's allegation.

However, contrary to the Examiner's allegations, none of the portions of the Sasaki et

al. reference support the Examiner's allegations that the discharge port 25 introduces an inert gas into a vacuum chamber. Rather, the Sasaki et al. reference discloses that the cleaning chamber 14 into which the discharge port 25 introduces an inert gas is "set to any pressure higher than the atmospheric pressure" (emphasis added, col. 6, lines 15-17). The Sasaki et al. reference explains that it provides a differential pressure gauge 27 that detects the pressure of the inert gas in the cleaning chamber 14 to determine the difference between the pressure within the cleaning chamber and the atmospheric pressure and is connected to a valve-controller 32 "which continually keeps the pressure of the inert gas in the cleaning chamber 14 positive, that is, higher than the atmospheric pressure." (Emphasis added, col. 6, lines 26-28).

Not only does the Sasaki et al. reference not teach that the cleaning chamber 14 is maintained at a vacuum, but the Sasaki et al. reference actually teaches away from allowing the pressure within the cleaning chamber 14 from dropping below atmospheric pressure. "By keeping the pressure of the inert gas in the cleaning chamber 14 positive, the air in the unit area R2 is prevented from flowing into the cleaning chamber14." Presumably, this solves the problems that are described at col. 2, lines 33-59 in the Sasaki et al. reference that can result if the air in the unit area R2 is permitted to flow into the cleaning chamber 14.

Therefore, not only does the Sasaki et al. reference not teach or suggest the features of the present invention including a mechanical drive in a vacuum device, but the Sasaki et al. reference actually teaches away from the claimed invention.

In stark contrast, the present invention is concerned with preventing the contamination of the surface of a semiconductor substrate from oil and/or grease that may be diffused into the vacuum atmosphere from a mechanical driver that is in the vacuum chamber and/or a

vacuum pump. The present invention obviates this problem by providing a discharge port in the vacuum chamber that supplies an inert gas. The flow of inert gas prevents any oil and/or grease that may become diffused into the vacuum atmosphere from contaminating the surface of the semiconductor substrate that is being processed.

Clearly, the Sasaki et al. reference does not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection of claims 1, and 3-5.

B. The 102(e) Mikata reference rejection

The Examiner alleges that the Mikata reference teaches the claimed invention. Applicants submit, however, that there are elements of the claimed invention which are neither taught nor suggested by the Mikata reference

The Mikata reference does not teach or suggest the features of the claimed invention including:1) a mechanical drive part that is moved in a vacuum device (independent claim 1); and 2) a mechanical driver in the vacuum chamber (independent claim 7). As explained above, the claimed invention is directed to solving the problem of oil and/or grease from a mechanical driver that is present in a vacuum chamber from contaminating a semiconductor substrate. The mechanical driver and/or drive part is adapted to move (i.e. translate, rotate, or tilt) a semiconductor substrate which is within the vacuum chamber. Thus, in order to perform this function the mechanical drive part is positioned within the vacuum chamber and since these mechanical drive parts rely upon oil and/or grease for lubrication, the presence of this oil and/or grease in the vacuum chamber tends to contaminate the semiconductor substrate.

The Examiner alleges that the Mikata reference discloses "a mechanical part 412 which is moved in a vacuum device." While Applicants agree that there is a mechanical "part" that is within the vacuum device, the claims do not merely recite a mechanical "part."

Rather, the claims recite a mechanical "drive part" (claim 1) and "a mechanical driver in the vacuum chamber that drives a semiconductor substrate holder" (claim 7). The driver part is a part that drives another part (i.e. a "driven" part). Thus, the term "driver."

In this instance, the shaft 412 that is disclosed by the Mikata reference is driven by a mechanical drive part that is not shown by the Mikata reference. The shaft 412 that is disclosed by the Mikata reference does not move up and down on its own. Rather, the shaft 412 is a driven part that must be driven up and down by an undisclosed drive part.

Further, since the Mikata reference does not disclose a drive part that drives the shaft 412 up and down while showing the entire reactive chamber 41, clearly the Mikata reference does not teach or suggest a mechanical drive part that is in a vacuum device.

The present invention is concerned with preventing the contamination of the surface of a semiconductor substrate from oil and/or grease that may be diffused into the vacuum atmosphere from a mechanical driver that is in the vacuum chamber and/or a vacuum pump. The present invention obviates this problem by providing a discharge port in the vacuum chamber that supplies an inert gas. The flow of inert gas prevents any oil and/or grease that may become diffused into the vacuum atmosphere from contaminating the surface of the semiconductor substrate that is being processed.

Clearly, the Mikata reference does not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection of claims 1, and 3-5.

III. FORMAL MATTERS AND CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully submits that claims 1-20, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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